

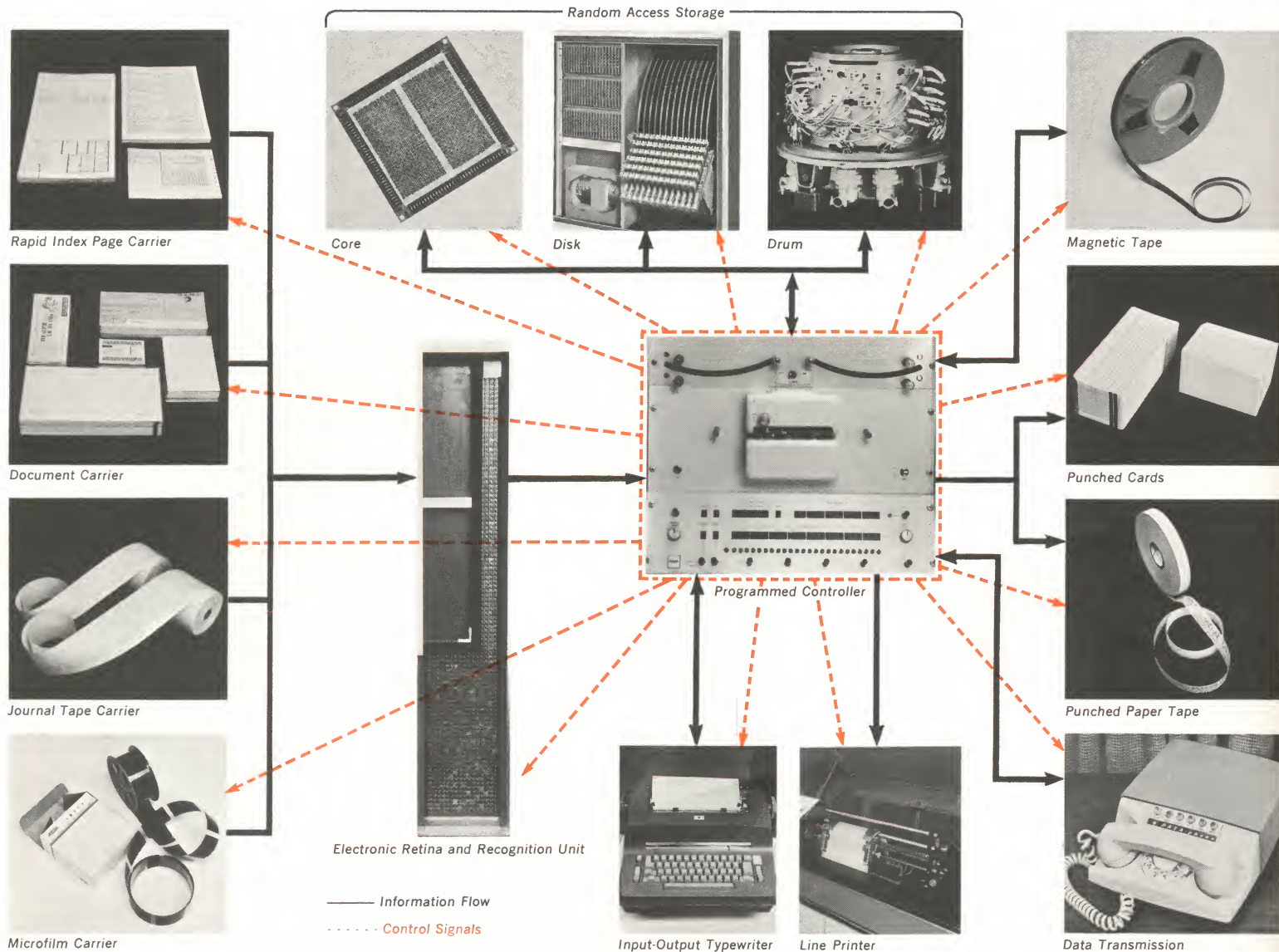
RECOGNITION EQUIPMENT

*Incorporated
Dallas, Texas*



Now – ELECTRONIC RETINA* COMPUTING READER

- Feeds your present computer more efficiently through source data automation
- Reduces current input costs
- Increases employee productivity
- Computes while reading to detect human errors earlier
- Cuts delays by eliminating key punching
- Extracts added management data without extra keystroking
- Improves utilization of present computer investment



FIVE DIMENSIONS OF MODULARITY

Permit user to install only the equipment to process identified work load.

1. By Document Style

- ☐ Rapid Index Page Carrier for pages
- ☐ Document Carrier for unit records
- ☐ Journal Tape Carrier for adding machine and cash register tapes
- ☐ Microfilm Carrier for filmed data
- ☐ Any two document handlers accommodated

2. By Number and Styles of Type

- ☐ Ordinary styles of printing
- ☐ Intermixed multiple type styles
- ☐ Type style selection by stored program control
- ☐ Additional plug-in character vocabulary

3. By Output Media

- ☐ Magnetic tape
- ☐ Punched cards
- ☐ Punched paper tape
- ☐ Wire transmission
- ☐ High-speed printout

4. By Data Editing Capability

- ☐ Up to 128,000 characters of core storage
- ☐ Processing at 1.75 microseconds word cycle time
- ☐ On-line random access storage
- ☐ Extra magnetic tape drives for file maintenance

5. By User's Reliability Requirements

- ☐ Low cost subsystem redundancy
- ☐ Complete duplicate system backup unnecessary



RAPID INDEX PAGE CARRIER SYSTEM

General purpose, program-controlled page reader

- ☐ Up to 2400 characters per second
- ☐ Page widths — $4\frac{7}{8}$ " to 14"; heights — $3\frac{1}{4}$ " to 14"
- ☐ Intermixed paper sizes and weights

☐ Real time program control:

Marks line on page
Defines data format
Separates selected pages
Rereads line
Balances input data to accounting controls



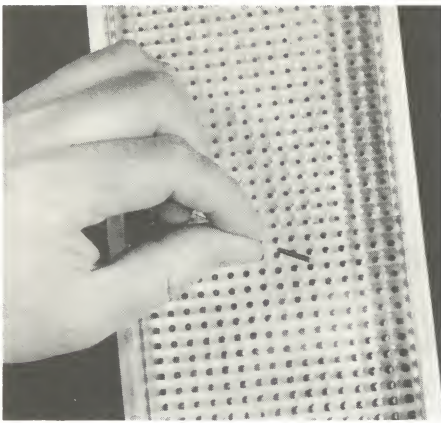
DOCUMENT CARRIER SYSTEM

General-purpose, program-controlled unit record reader

- ☐ Two full lines read from document
- ☐ Up to 1800 documents per minute
- ☐ Document widths — 2" to $8\frac{3}{4}$ "; heights — 2" to 5"
- ☐ Document weights — flimsy paper to card stock intermixed
- ☐ Document stackers in modules of 3 (21 stackers maximum)
- ☐ Sorting, collating, code printing, and code reading available

☐ Real time program control:

Operates paper handler
Marks documents
Defines format
Selects output stacker
Segregates out-of-balance batches



ELECTRONIC RETINA*

Reads like the human eye. Complete character image is projected on Retina at one time. Unique three-dimensional approach bases recognition on height, width, and gray shades of character. Table at right shows how the Electronic Retina solves character recognition problems —

Character

	Line Finder	Vertical Analyzer	Amplitude Correlator	Classification Filter	Character Correlator	Decision Generator
Smudges		X				
Misregistration (vertical)	X					
Stroke intensity variation		X				
Stroke integrity						
• voids (missing elements in stroke)				X	X	
• extraneous marks (ink and paper defects)				X	X	
Touching characters				X	X	
Skew	X					
Contrast to background		X				
Pitch						X
Small area differences in character pattern (e. g., Q and O)			X			

Lines

Skew		X				
Locations						
• printing tolerances	X	X				
• reader tolerance	X					
Density (e. g., single spacing)	X					

Pages

Size variation						
• paper shrinkage — humidity	X	X				X
• accurate page positioning	X					

Line Finder—Location and tracking information for the next line is obtained while reading current line. This is accomplished by an extension of the Electronic Retina consisting of a column of light sensors.

Vertical Analyzer—The Electronic Retina is three times as tall as the character focused upon it. The Vertical Analyzer computes and switches that portion of the Retina containing the character. This handles character misplacement up to one full character height.

Amplitude Correlator—Each Retina cell assumes the characteristic of the sum of a

number of adjacent cells. This provides video clean-up of the character stroke by a process analogous to the human recognition method.

Classification Filter—This portion of the Recognition Unit emphasizes small differences in similar characters. It utilizes size and shape information to discriminate for character identification and minimizes the possibility of character substitution.

Character Correlator—This section of the system compares the three-dimensional character information present on the Electronic Retina against the equivalent

three-dimensional information stored in the machine's character vocabulary.

Decision Generator—These logical circuits identify the character present on the Retina. Two different criteria are employed: ☐ Percentage of perfect match ☐ Difference between best and next best match. Both criteria must be fulfilled for character identification. The controls for these criteria can be altered. This enables human judgment to prevail in determining the economic balance between rejects and substitutions.

RAPID INDEX PAGE CARRIER

Page in fixed position on moving platform while reading

- ☐ Provides simultaneous page feeding, reading, and stacking
- ☐ Aligns pages automatically
- ☐ Eliminates jams in reading station
- ☐ Minimizes time "lost" by paper handling problems
- ☐ Stacks pages in input sequence



DOCUMENT CARRIER

Air and vacuum technology for document handling

- ☐ Accepts intermixed paper weights and sizes
- ☐ Handles documents with staples, clips, tears, and stickers
- ☐ Accommodates folds and dog-ears
- ☐ Transports and sorts low-cost carbon backed paper
- ☐ Minimizes paper jams and prevents document mutilation
- ☐ Exposes paper transport for visibility and ready access
- ☐ Avoids static electricity problems
- ☐ Permits fast, reliable selection of read areas



PROGRAMMED CONTROLLER

High-speed, low-cost, general-purpose computer for real-time control of character recognition and paper handling plus on-line data processing.

- ☐ Minimizes programming cost through available programming systems
- ☐ Provides for on-line restart after any interruptions in operation
- ☐ Computes while document is being read
- ☐ Stores and formats data to write magnetic tape
- ☐ Prepares magnetic tape compatible in code and density with your computer
- ☐ Performs editing, accumulating, balancing, check-digit verifying, and parity checking
- ☐ Controls sorting and collating of documents
- ☐ Permits paper handler and output units to operate simultaneously
- ☐ Accommodates growth with larger, higher speed compatible modules
- ☐ Allows unlimited reading format flexibility



PRIORITY INTERRUPTS FOR PROGRAM CONTROL

Priority interrupts are generated during reading to activate stored instructions from the Programmed Controller. These instructions enable the Programmed Controller to track reading position, identify information read, and control system operation. System control is based upon location and performance information plus data content of paper.

Examples of Priority Interrupt assignments are:

- | | |
|---|---|
| <input type="checkbox"/> Begin page | <input type="checkbox"/> Valid character |
| <input type="checkbox"/> End page | <input type="checkbox"/> Character reject |
| <input type="checkbox"/> Begin line | <input type="checkbox"/> Space recognized |
| <input type="checkbox"/> Line complete | <input type="checkbox"/> Vertical line recognized |
| <input type="checkbox"/> Program count complete | |

STORED INSTRUCTIONS FOR READER CONTROL

Through use of stored programs, the Programmed Controller directs the Reader continuously. It acquires the needed data while the document is being processed. The user's application program is assembled automatically into Recognition Equipment's Executive Program which generates the real time commands.

Examples from the repertoire of commands sent by the Programmed Controller to the Electronic Retina and Paper Handler are:

- | | |
|--|---|
| <input type="checkbox"/> Start feeding | <input type="checkbox"/> Inhibit alphabetic |
| <input type="checkbox"/> Stop feeding | <input type="checkbox"/> Inhibit numeric |
| <input type="checkbox"/> Reread | <input type="checkbox"/> Inhibit symbols |
| <input type="checkbox"/> Mark line | <input type="checkbox"/> Allow alphabetic |
| <input type="checkbox"/> Stacker 1 | <input type="checkbox"/> Allow numeric |
| <input type="checkbox"/> Stacker 2 | <input type="checkbox"/> Allow symbols |
| <input type="checkbox"/> Blind scan vertical | <input type="checkbox"/> All fonts on |
| <input type="checkbox"/> Blind scan horizontal | <input type="checkbox"/> Font "X" off |

Recognition Equipment's program library includes these instructions.

PROGRAMMING SYSTEMS

Extensive programming systems are provided to reduce the amount of applications programming done by the user. Existing software permits simple, rapid re-entry of rejects and corrections. All popular data field "edits" are available as subroutines. A special programming package enables direct substitution of typing for key punching.

Example programs and routines:

- ☐ Executive Program (a real-time program)
- ☐ Literal Assembly Program (language assembler)
- ☐ Report Generator
- ☐ Sort/Merge
- ☐ FORTRAN II Compiler
- ☐ META-SYMBOL
- ☐ Key punch Simulator
- ☐ Key Verification Simulator
- ☐ Program Operating Procedures (subroutines)
 - General area filler
 - Edit and justify
 - One-to-four MAP
 - Edit numeric
 - Edit alphabetic
 - Check digit verification

GENERAL

- ☐ Systems, forms design, and programming classes are conducted regularly for customer personnel.
- ☐ A full-time systems engineer is on-site with each system to perform preventive maintenance and assist in programming and forms design.
- ☐ Equipment is available on a service bureau basis.
- ☐ Selection of contract terms:
 - Purchase
 - Different lease durations
 - Purchase options in lease

For additional information write or call collect:



RECOGNITION EQUIPMENT *Incorporated*

Ross at Prairie Avenue, Dallas 4, Texas • 214 — TAYlor 3-8194



Ross at Prairie Avenue, Dallas 4, Texas - Taylor 3-8194
Cable Address: RECOGEQUIP Telex: 073-2342

September 12, 1966

Mr. T. Nelson
Systems Consultant
Box 1546
Pooghkeepsie,
New York 12603

Dear Mr. Nelson:

Thank you for your interest in our Electronic Retina Computing Reader.

Enclosed is a brochure that describes this system and its operation. The Electronic Retina Computing Reader is the first production optical character recognition system with the broad, general-purpose capabilities to meet the requirements of the sophisticated, high-volume user of data processing equipment.

This system, which typically sells for \$475,000 to \$600,000 or leases for \$14,000 to \$16,000 per month, is performing profitably in a wide range of applications.

If you would like additional information, please contact the appropriate regional office listed below.

Sincerely,

Ed Wattenbarger, Director
Business Communications

pm

Enclosure

WESTERN REGION
Tom Dunicliffe
Regional Sales Manager
1101 South Crenshaw Street
Los Angeles, California 90019
(213) 933-9585

MIDWESTERN REGION
Robert Montgomery
Regional Sales Manager
188 West Randolph Street
Chicago, Illinois 60601
(312) 346-9533

SOUTHERN REGION
Jack Meredith
Regional Sales Manager
4703 Ross Avenue
Dallas, Texas 75204
(214) 823-8194

EASTERN REGION
John Arnold
Regional Sales Manager
815 Connecticut Avenue, N.W.
Washington, D.C. 20006
(202) 659-2542

FEDERAL REGION
John Hoyle
Manager
815 Connecticut Avenue, N.W.
Washington, D.C. 20006
(202) 659-2542

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SHRDLU ETAOIN PHINK
SHRDLU BESSIE LOUISE
STORM TEMPEST

HIGH SCHOOL SUBJECT ELECTIONS

PUBLIC SCHOOLS

THILLEN SUSAN ELIZABETH

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PRESENT DIVISION

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Jones' Used Cars

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3005 Fifth Avenue

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DEPARTMENT OF REVENUE MOTOR VEHICLE DIV.

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REGISTRATION FORM

PUBLIC SCHOOLS

BLAINE ELEMENTARY 2300

019951 GUY MARY ELLEN 032454 CHICAGO X

PUBLIC SCHOOLS ATTENDANCE ROSTER

LANE HIGH 06/10/64 1 0 09 526 1440

ALVAREZ JUAN JOSE 00092630

1312 W ERIE 22

VA40946

ALVAREZ ESPERIDION

NEW LOAN/RECORD CHANGE DATA

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NOT VALID UNTIL RECEIPTED BY CASHIER

Remember: you are typing through Five (5) Copies

COUNTY 19 64 ADAMS

IDENTIFICATION NO. 10927K129285

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STOCK TRANSFER OR ABSTRACT

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TOTAL

LOS ANGELES

SAN FRANCISCO

EITHER DIRECTION

Via AIR LINES, INC.

EXCESS BAGGAGE TICKET

EXCESS WEIGHT (LBS.) FROM:				
1 THRU 10	11 THRU 20	21 THRU 30	31 THRU 40	41 OR MORE
\$.50	\$ 1.00	\$ 1.50	\$ 2.00	FIRST 40 LBS. \$2.00 @ \$.07 PER LB.

AUDITOR'S COUPON

FORM OF PAYMENT